CTEH® CENTER FOR TOXICOLOGY AND ENVIRONMENTAL HEALTH, LLC

Mission Incident
Santa Paula, CA
Preliminary Summary of Air Monitoring Results
December 18, 2014

Prepared by
Center for Toxicology and Environmental Health, L.L.C. (CTEH®)

CTEH® CENTER FOR TOXICOLOGY AND ENVIRONMENTAL HEALTH, LLC

Introduction

Center for Toxicology and Environmental Health, LLC (CTEH®) continued air monitoring in support of response activities following a vac truck explosion and fire in Santa Paula, CA.

This submittal summarizes air monitoring data for December 18, 2014 07:00 to December 19, 2014 07:00.

Real-time Air Monitoring

All instrumentation was calibrated at least once per day or per manufacturer's recommendations. Manually-logged real-time air monitoring was conducted for chlorine (Cl_2), hydrogen sulfide (H_2S), hydrochloric acid (HCl), percent of the Lower Explosive Limit (LEL), oxygen (O_2), peroxides, particulate matter (10 micron particles, PM_{10}), sulfur dioxide (SO_2), sulfuric acid (H_2SO_4), and volatile organic compounds (VOCs), with instruments such as Gastec® pumps with chemical-specific colorimetric tubes, RAESystems® MultiRAE Plus and MultiRAE Pro PID with chemical-specific sensors, and TSI® AM510s for particulate matter. Monitoring was conducted by CTEH® personnel in the work area, at fixed locations in the surrounding community, and along the perimeter of the facility in the community. Table 1 summarizes monitoring data for manually-logged real-time readings. Maps including the site location, fixed community real-time air monitoring locations, aerial site photo, and roaming monitoring are included in Appendix A.

CTEH® monitored RAESystems© AreaRAE units with ProRAE Guardian system at four locations on the fence line of the facility within the work area. An additional unit (Unit 06) was deployed in conjunction with work operations near frac tanks as recommended by the onsite safety officer. Unit 09 was deployed in the cab of an excavator supporting solidification operations in the Exclusion Zone. AreaRAE Unit 11 was deployed on Mission Rock Road on the outer fence line of the Santa Clara Waste Water facility primarily to monitor Cl_2 concentrations between the 120 barrel tank truck and the road. AreaRAEs were equipped with sensors to detect VOCs, LEL, H_2S, and SO_2. Unit 02 recorded three instantaneous detections of H_2S during this reporting period above the action level of 1 ppm, ranging from 1 to 1.3 ppm. These concentrations were not sustained for more than one 15-second polling interval. Table 2 summarizes monitoring data for AreaRAE monitoring. AreaRAE graphs displaying real-time air monitoring data as well as 15-minute rolling averages and a map depicting AreaRAE locations are included in Appendix B.

Particulate monitors were collocated with AreaRAE stations 1, 2, 3 and 4 and data-logged to monitor PM_{10}. An additional two units were data-logged and placed in the cab with operators in the excavators supporting solidification operations in the Exclusion Zone. Table 3 summarizes data-logged particulate monitoring data.

Table 1: Manually-Logged Real-Time Air Monitoring Summary[1]
December 18, 2014 07:00 – December 19, 2014 07:00

Location Category	Analyte	Instrument	No. of Readings	No. of Detections	Avg. of Detections	Detection Range[2]
Community	Cl_2	Gastec 8La	7	0	NA	<0.05 ppm
	H_2S	MR+ / MR Pro	27	0	NA	<1 ppm
	HCl	Gastec 14L	6	0	NA	<0.05 ppm
	LEL	MR+ / MR Pro	27	0	NA	<1 %
	O_2	MR+ / MR Pro	27	27	20.9	20.9 - 20.9 %
	Peroxides	Gastec 32	6	0	NA	<0.1 ppm
	PM_{10}	AM510/Dusttrak	27	27	0.012	0.005 - 0.022 mg/m^3
	SO_2	MR+ / MR Pro	27	0	NA	<0.1 ppm
	H_2SO_4	Gastec 35	6	0	NA	<0.2 mg/m^3
	VOC	MR+ / MR Pro	27	0	NA	<0.1 ppm
Work Area	Cl_2	Gastec 8La	11	0	NA	<0.05 ppm
		MR+ / MR Pro	15	0	NA	<0.1 ppm
	H_2S	MR+ / MR Pro	21	0	NA	<0.1 ppm
	HCl	Gastec 14L	4	0	NA	<0.05 ppm
	LEL	MR+ / MR Pro	35	0	NA	<1 %
	O_2	MR+ / MR Pro	36	36	20.9	20.9 - 20.9 %
	Peroxides	Gastec 32	6	0	NA	<0.1 ppm
	PM_{10}	AM510/Dusttrak	15	15	0.03	0.005 - 0.112 mg/m^3
	SO_2	MR+ / MR Pro	18	0	NA	<0.1 ppm
	H_2SO_4	Gastec 35	3	0	NA	<0.2 mg/m^3
	VOC	MR+ / MR Pro	34	0	NA	<0.1 ppm

[1]*Note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.*
[2]*Maximum detections preceded by the "<" symbol are considered non-detects below reporting limit to the right.*

Table 2: AreaRAE Air Monitoring Summary[1]
December 18, 2014 07:00 – December 19, 2014 07:00

Unit ID	Analyte	No. of Readings	No. of Detections	Avg. of Detections	Detection Range[2]
Unit 01	H_2S	5318	1115	0.1 ppm	0.1 - 0.4 ppm
	LEL	5319	0	NA	< 1 %
	SO_2	5319	0	NA	< 0.1 ppm
	VOC	5319	4	0.1 ppm	0.1 - 0.1 ppm
Unit 02	H_2S	5483	368	0.1 ppm	0.1 - 1.3 ppm
	LEL	5483	0	NA	< 1 %
	SO_2	5483	1	0.1 ppm	0.1 - 0.1 ppm
	VOC	5483	45	0.1 ppm	0.1 - 0.2 ppm
Unit 03	H_2S	5551	7	0.1 ppm	0.1 - 0.1 ppm
	LEL	5551	0	NA	< 1 %
	SO_2	5551	0	NA	< 0.1 ppm
	VOC	5551	34	0.1 ppm	0.1 - 0.2 ppm
Unit 04	H_2S	5154	1	0.1 ppm	0.1 - 0.1 ppm
	LEL	5154	0	NA	< 1 %
	SO_2	5154	0	NA	< 0.1 ppm
	VOC	5154	0	NA	< 0.1 ppm
Unit 06	H_2S	2051	552	0.1 ppm	0.1 - 0.2 ppm
	LEL	2051	0	NA	< 1 %
	SO_2	2051	0	NA	< 0.1 ppm
	VOC	2051	58	0.1 ppm	0.1 - 0.3 ppm
Unit 09	LEL	2051	0	NA	< 1 %
	SO_2	2051	266	0.1 ppm	0.1 - 0.1 ppm
	VOC	2051	25	0.1 ppm	0.1 - 0.1 ppm
Unit 11	Cl_2	5604	31	0.1 ppm	0.1 - 0.1 ppm
	LEL	5604	0	NA	< 1 %
	SO_2	5604	4	0.2 ppm	0.1 - 0.4 ppm
	VOC	5604	5	0.2 ppm	0.1 - 0.3 ppm

[1]*Note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.*
[2]*Maximum detections preceded by the "<" symbol are considered non-detects below reporting limit to the right.*

Table 3: AM510 PM_{10} Monitoring Summary[1]
December 18, 2014 07:00 – December 19, 2014 07:00

Serial No.	Location	No. of Readings	No. of Detections	Avg. Detection	Detection Range
10601072	AR01	1758	1758	0.007	0.001 - 0.124 mg/m^3
10408087	AR02	1255	1241	0.009	0.001 - 0.283 mg/m^3
10704074	AR03	860	607	0.012	0.001 - 0.235 mg/m^3
10503020	AR04	3448	3269	0.011	0.001 - 0.243 mg/m^3
11005015	Excavator 200D	2235	2172	0.01	0.001 - 0.249 mg/m^3
10704070	Excavator 210G	142	139	0.007	0.001 - 0.042 mg/m^3

[1]*Note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.*

Appendix A

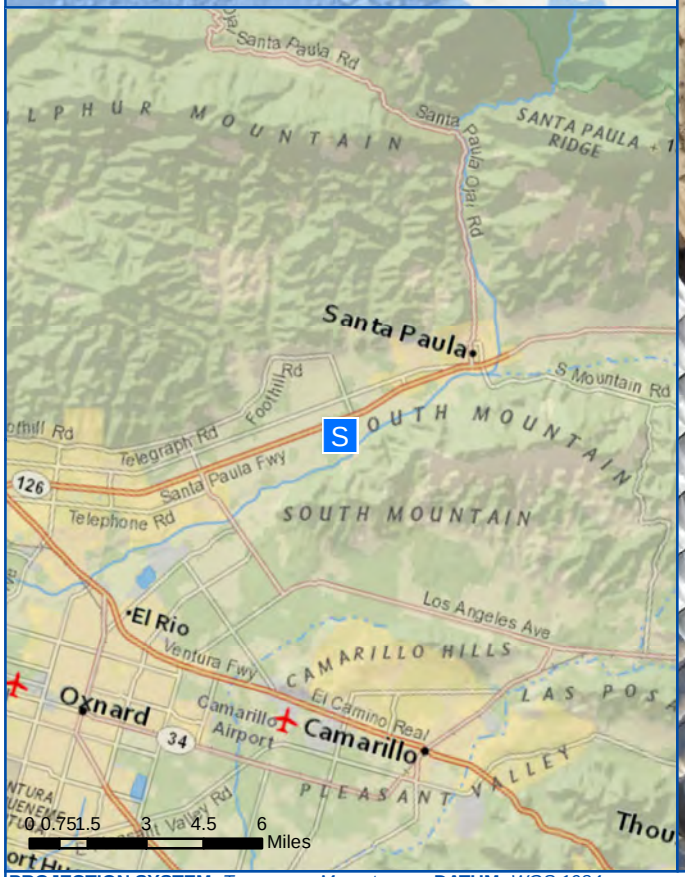
Incident Maps:

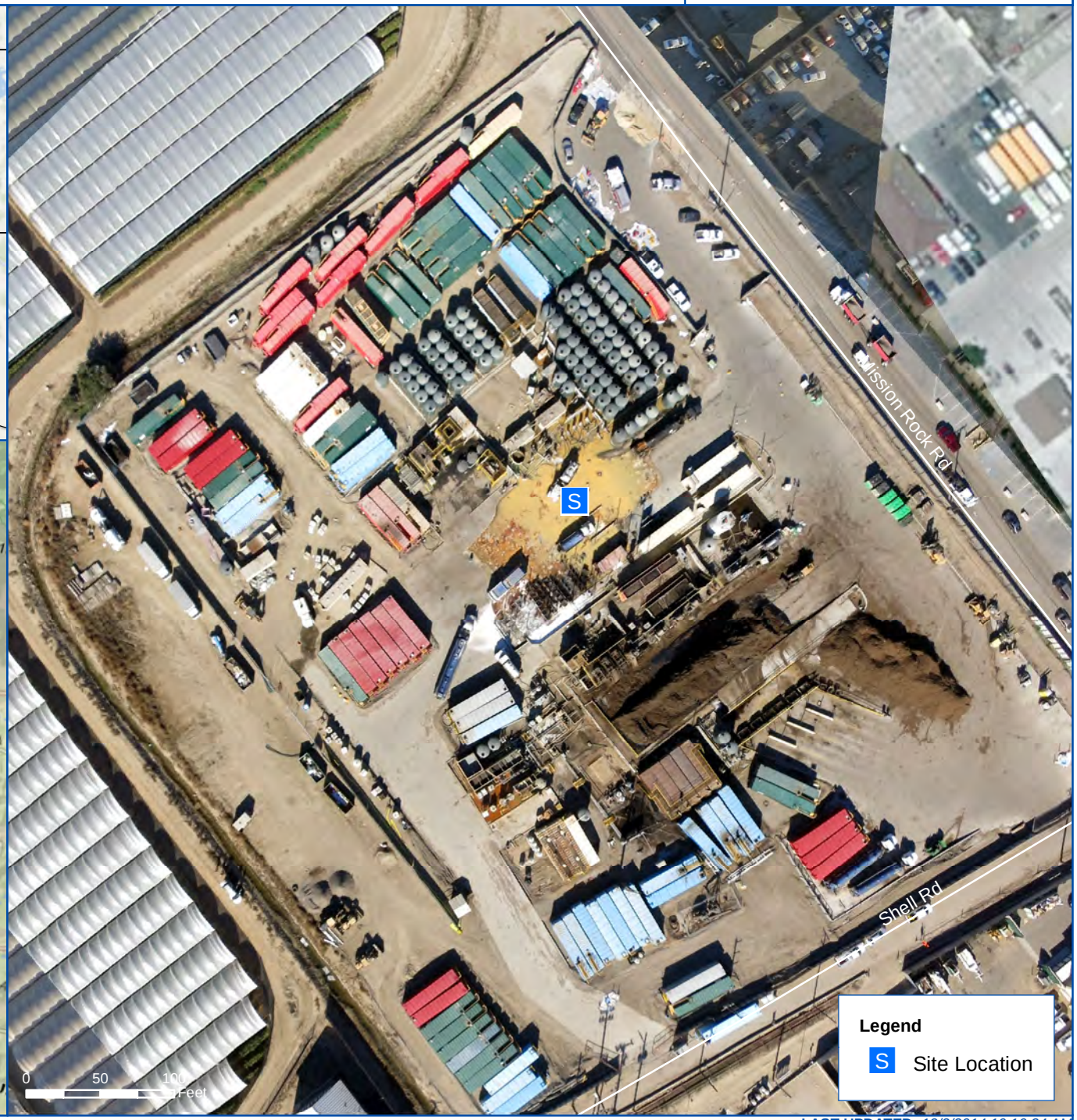
Real-time Air Monitoring Locations and Incident Site

Site Location

Mission Incident

Project: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura





PROJECTION SYSTEM: *Transverse Mercator* **DATUM:** *WGS 1984* **LAST UPDATED:** *12/2/2014 10:10:34 AM*

Aerial Overview - 12/18/2014

Mission Incident

Project: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *Transverse Mercator* **DATUM:** *WGS 1984* **LAST UPDATED:** *12/19/2014 2:55:38 PM*

Fixed Community Real-Time Air Monitoring Station Locations

Mission Incident

Project: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *Transverse Mercator* **DATUM:** *WGS 1984* **LAST UPDATED:** *11/25/2014 12:22:02 PM*

Manually Logged Real-Time Air Monitoring Concentrations

VOC - Dec 18, 2014 07:00 to Dec 19, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* COORDINATE SYSTEM: *WGS84*

Print Date: *12/19/2014 10:32:24 AM*

Manually Logged Real-Time Air Monitoring Concentrations

H_2SO_4 - Dec 18, 2014 07:00 to Dec 19, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* **COORDINATE SYSTEM:** *WGS84* **Print Date:** *12/19/2014 1:38:38 PM*

Manually Logged Real-Time Air Monitoring Concentrations

SO_2 - Dec 18, 2014 07:00 to Dec 19, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* **COORDINATE SYSTEM:** *WGS84* **Print Date:** *12/19/2014 1:38:06 PM*

Manually Logged Real-Time Air Monitoring Concentrations

PM_{10} - Dec 18, 2014 07:00 to Dec 19, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* **COORDINATE SYSTEM:** *WGS84* **Print Date:** *12/19/2014 1:36:49 PM*

Manually Logged Real-Time Air Monitoring Concentrations

Peroxides - Dec 18, 2014 07:00 to Dec 19, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* **COORDINATE SYSTEM:** *WGS84*

Print Date: *12/19/2014 1:32:16 PM*

Manually Logged Real-Time Air Monitoring Concentrations

O_2 - Dec 18, 2014 07:00 to Dec 19, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* **COORDINATE SYSTEM:** *WGS84* **Print Date:** *12/19/2014 1:31:10 PM*

Manually Logged Real-Time Air Monitoring Concentrations

LEL - Dec 18, 2014 07:00 to Dec 19, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* COORDINATE SYSTEM: *WGS84*

Print Date: *12/19/2014 1:29:49 PM*

Manually Logged Real-Time Air Monitoring Concentrations

HCl - Dec 18, 2014 07:00 to Dec 19, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* **COORDINATE SYSTEM:** *WGS84*

Print Date: *12/19/2014 1:28:36 PM*

Manually Logged Real-Time Air Monitoring Concentrations

H_2S - Dec 18, 2014 07:00 to Dec 19, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* COORDINATE SYSTEM: *WGS84*

Print Date: *12/19/2014 10:34:34 AM*

Manually Logged Real-Time Air Monitoring Concentrations

Cl_2 - Dec 18, 2014 07:00 to Dec 19, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* **COORDINATE SYSTEM:** *WGS84*

Print Date: *12/19/2014 10:33:28 AM*

Appendix B:

AreaRAE Trend Graphs, AM510 Trend Graphs, and Location Map

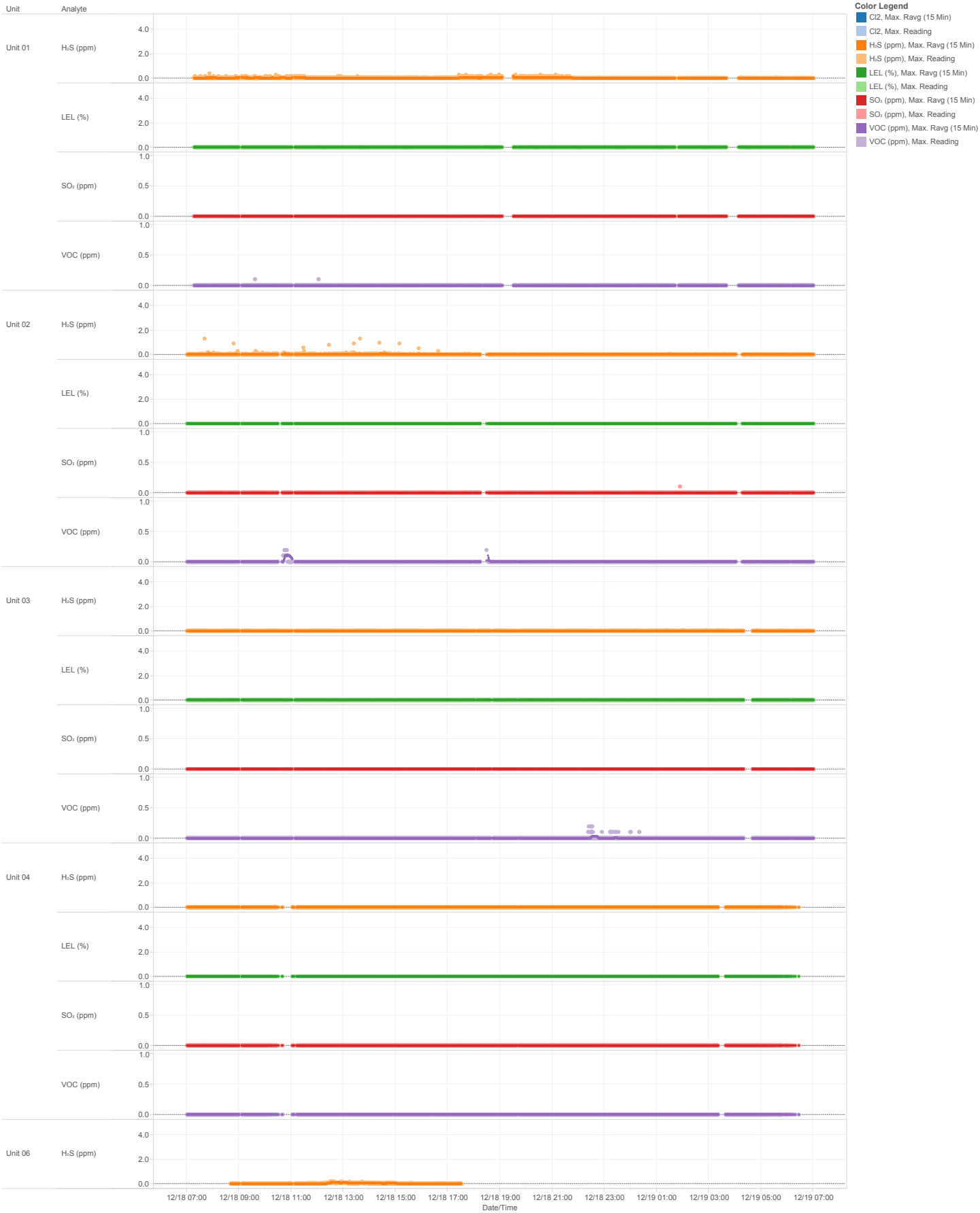
AreaRAE and AM510 Locations

Mission Incident

Project: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

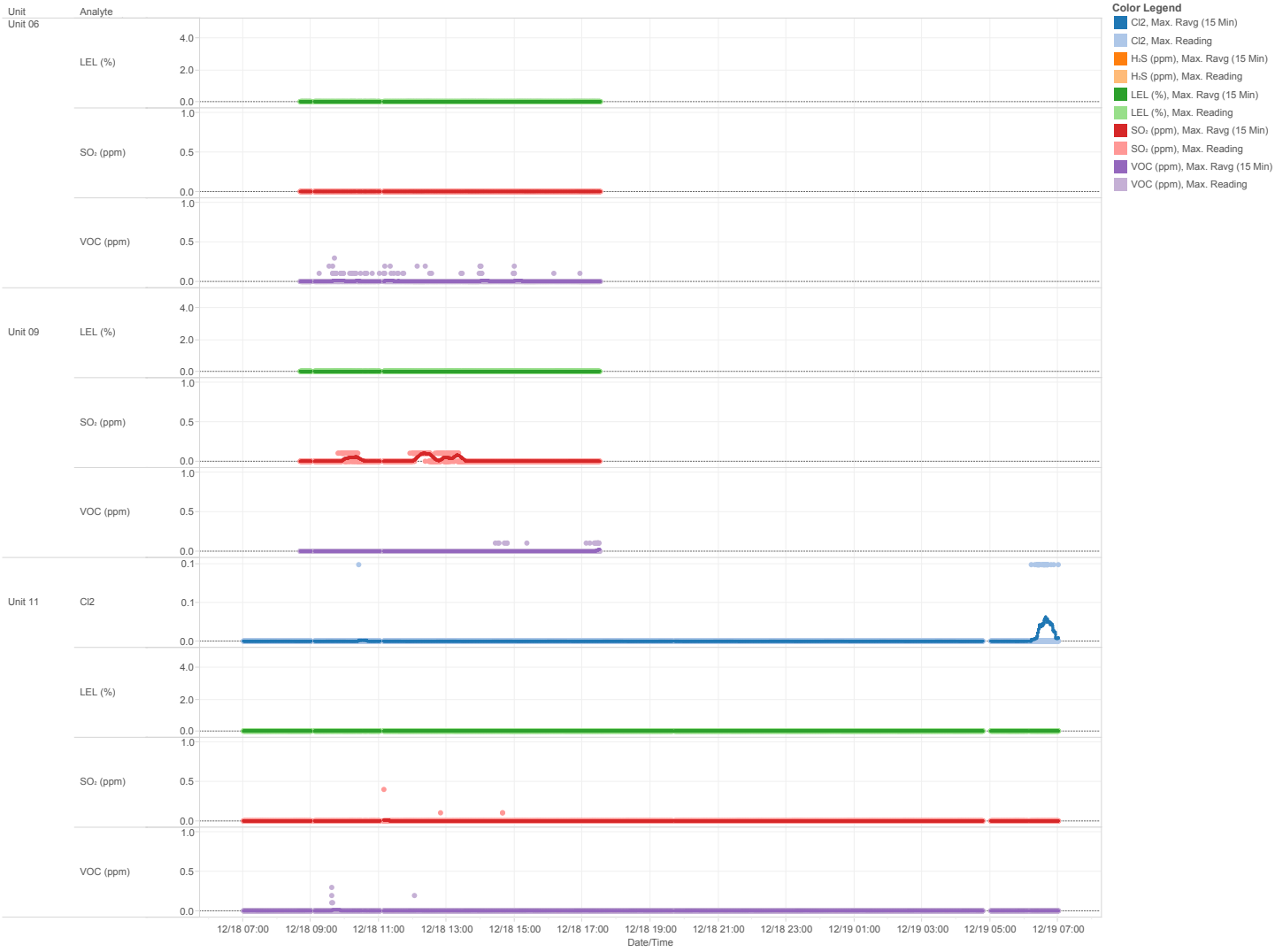
PROJECTION SYSTEM: *Transverse Mercator* **DATUM:** *WGS 1984* **LAST UPDATED:** *12/19/2014 2:56:49 PM*

Patriot Environmental
AreaRAE Trend Graphs
12/18/2014 07:00 - 12/19/2014 07:00



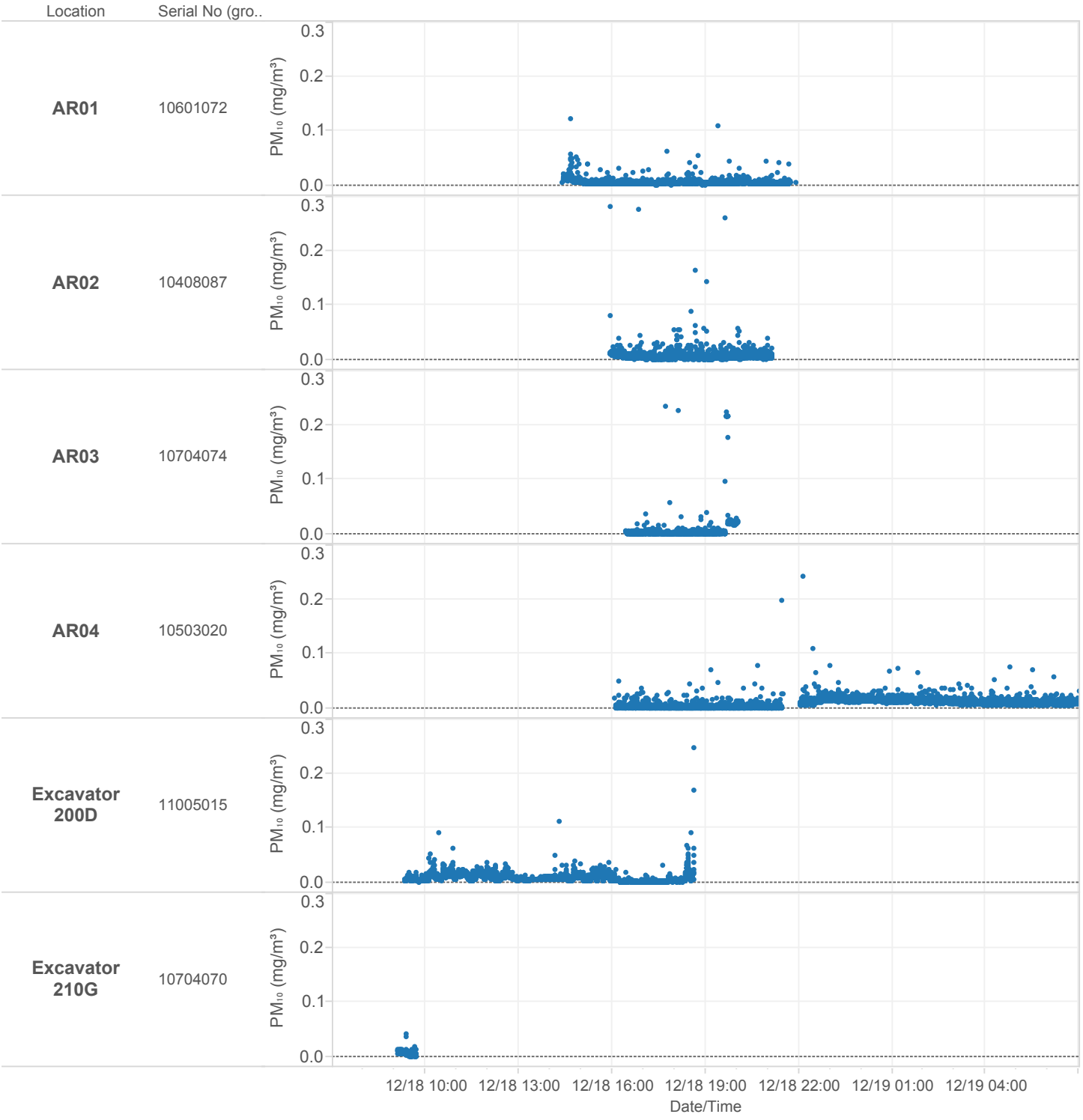
- The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format
- AreaRAE data may contain "drift events." Drift is defined as interference in the electrochemical sensor's ability to accurately report the concentration of a chemical in the atmosphere, resulting in "false positives"

Patriot Environmental
AreaRAE Trend Graphs
12/18/2014 07:00 - 12/19/2014 07:00



- The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format
- AreaRAE data may contain "drift events." Drift is defined as interference in the electrochemical sensor's ability to accurately report the concentration of a chemical in the atmosphere, resulting in "false positives"

Patriot Environmental
MISSION INCIDENT
Datalogged AM510 (PM_{10}) Summary
12/18/2014 07:00 - 12/19/2014 07:00



- The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format